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(58) Field of search
A4F

(54) Vacuum cleaner nozzle having
rotating brush

(57) A nozzle assembly 10 for a vacuum cleaner is provided with floor engaging wheels 16 that are frictionally engaged with and rotate wheels 25 that are secured to the ends of a brush 30 thereby causing the brush to rotate. The latter agitates the carpet or other floor covering to loosen and direct dirt particles toward the inlet slot 31 of the vacuum cleaner nozzle.

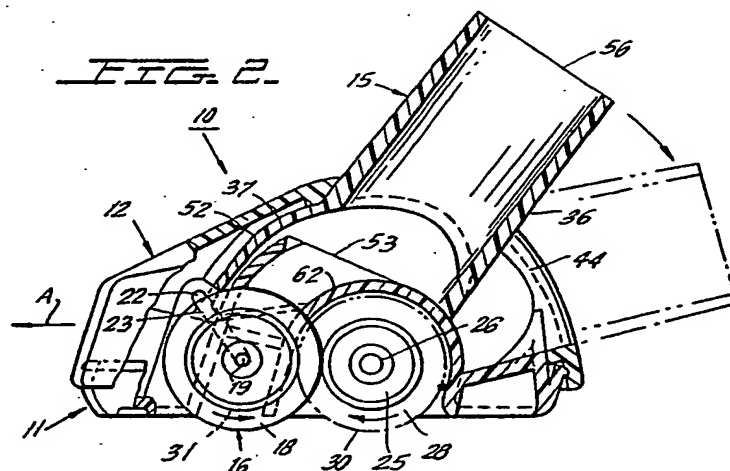
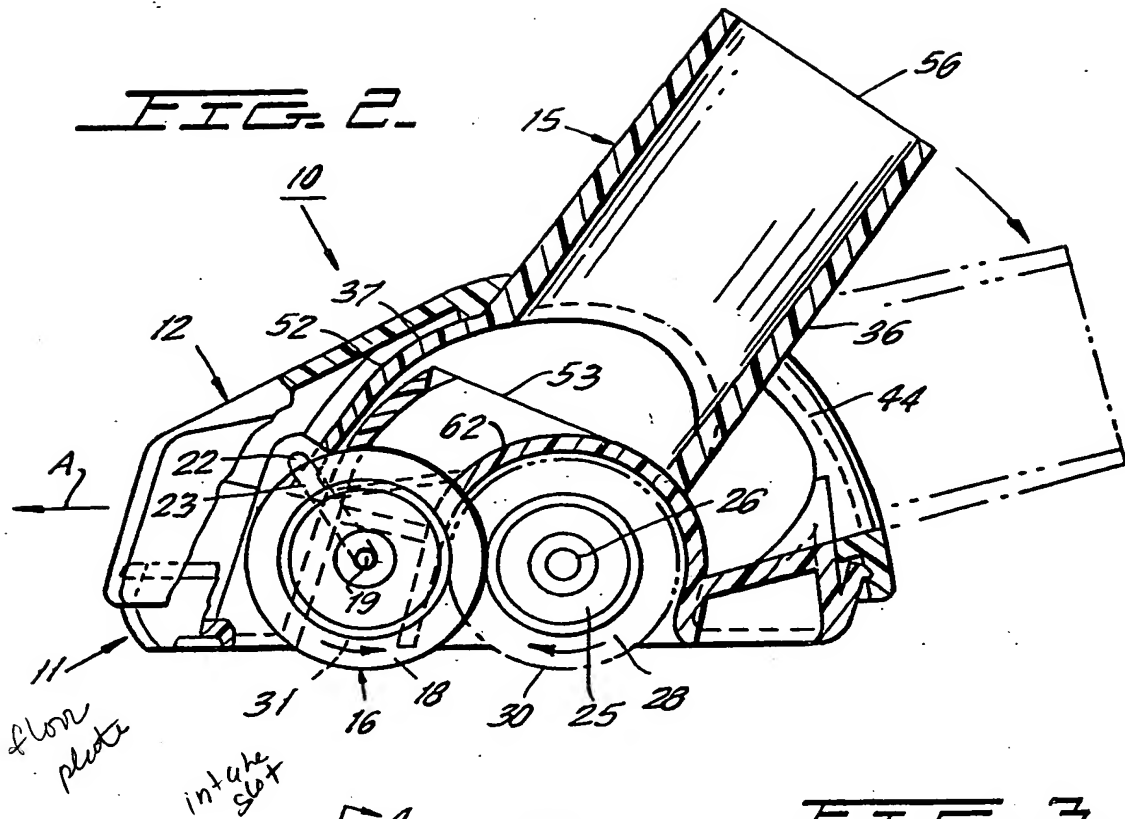
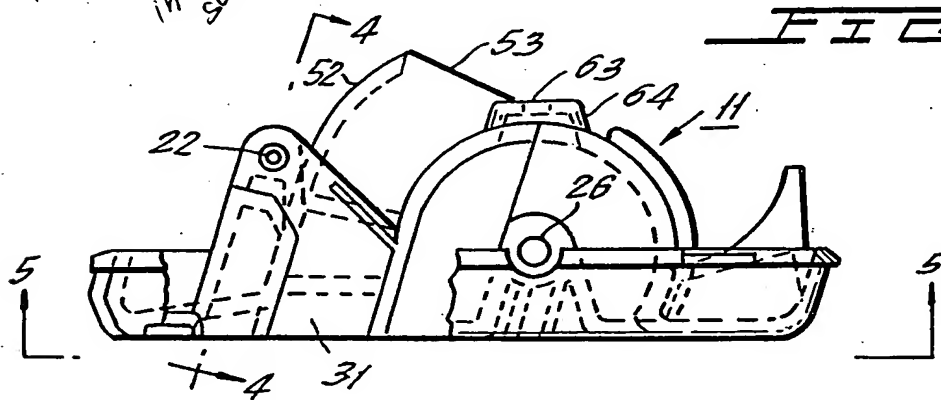
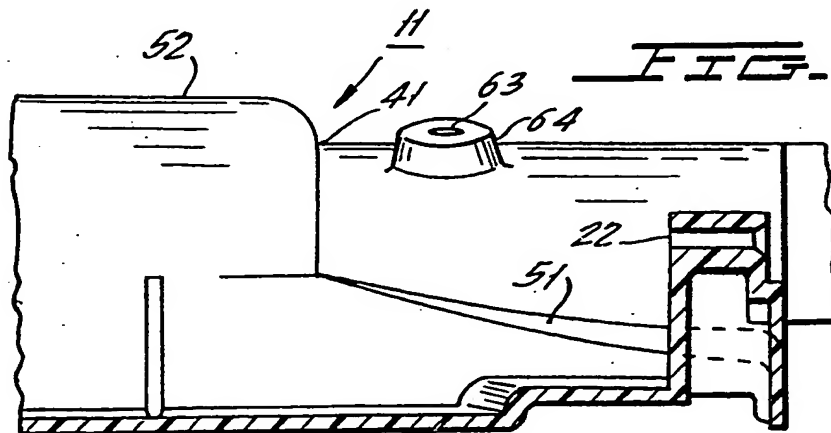


FIG. 2.FIG. 3.FIG. 4.

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FIG. 6.

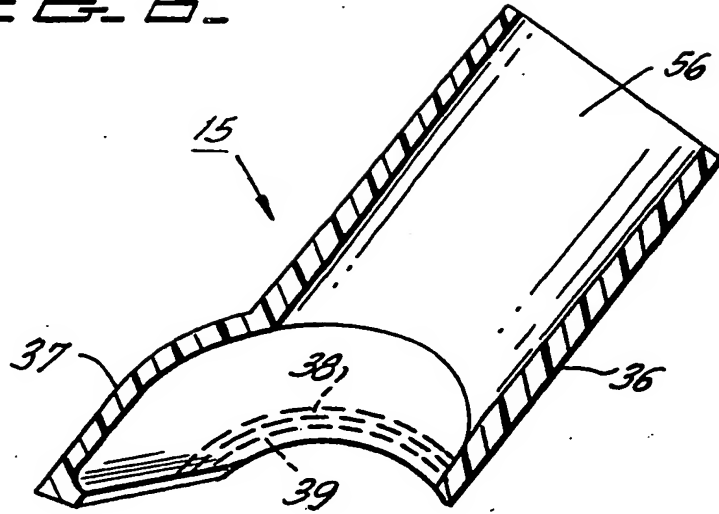


FIG. 7.

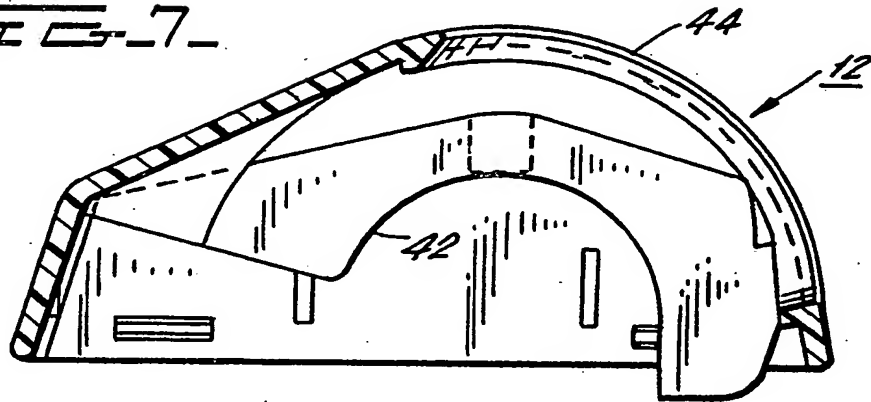
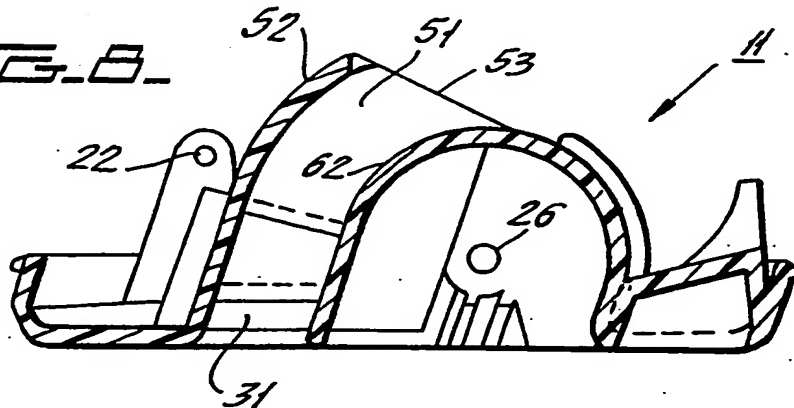


FIG. 8.



applied to nozzle assembly 10 at its outlet, the upper end of swivel fitting 15. The latter is a hollow member having cylindrical neck portion 36 that extends upward from the center of horizontally extending bearing portion 37. The outboard ends of bearing portion 37 are formed with arcuate seats 38, 39. Lower seat 39 rests against arcuate bearing formation 41 of floor plate 11 and upper seat 38 receives arcuate bearing formation 42 of cover 12 so that swivel fitting 15 is retained in its operative position through the cooperation of floor plate 11 and cover 12. Swivel fitting 15 is retained in its operative position through the cooperation of floor plate 11 and cover 12. Swivel fitting 15 is pivotable about a horizontal axis to permit neck 36 to move forward and rearward, in a vertical plane. This movement is limited by the end boundaries of slot 44 in cover 12.

The lower or entrance end of slot 31 extends for nearly the full width of floor plate 11, but tapers gradually in an upward direction to a much smaller width as defined by sloping partitions 51 of floor plate 11. At their inboard ends, partitions 51 are connected by upwardly bulging hood 52. The latter is disposed within bearing formation 37 and is open at its upper end to provide aperture 53. The latter permits communication between the interior of swivel fitting neck 36 and slot entrance 31 so that with an elongated hollow handle (not shown) connected to a suction source removably secured to neck 36, in a manner well known to the art, dirt at entrance 31 will be drawn through nozzle assembly 10 and exit therefrom through the open upper end 56 of neck 36.

Floor plate 11 also includes partition 62 which is generally arcuate in cross section and provides a hood that covers the upper portion of brush 30. Clearance apertures 63, 63 are provided in upward protrusions 64, 64 of floor plate 11 for the passage of screws 14, 14 that are received by apertures in internal embossments 65, 65 of cover 12. Internal formations of floor plate 11 also form individual recesses 61, 61 for wheels 16, 16. To minimize stresses between moving elements, floor engaging wheels 16, 16 are independently and floatingly mounted. That is, the position of each wheel 16 relative to its cooperating driven wheel 25 does not depend upon the relative position of the other wheel 16 with respect to its driven wheel 25. This condition is enhanced by having axle end 21 freely rotatable in bearing aperture 22. Thus, as nozzle assembly 10 is moved forward in the direction indicated by arrow A, not only does drive wheel 16 rotate counter-clockwise, but it also pivots bodily about axle end 21 as a center to assure that wheel 16 engages wheel 25.

As nozzle assembly 10 is moved rearward, drive wheel 16 will usually rotate driven wheel 25 in a counter-clockwise direction. Under these circumstances some dirt particles loosened by brush 30 will be carried by the latter along the inner surface of partition 62 and then be deposited on the floor adjacent to intake slot 31 while the remaining dirt particles (those that are not moved along the interior surface of partition 62) will fall to the floor and

be picked up when they are reached by slot 31.

Although a preferred embodiment of this invention has been described, many variations and modifications will now be apparent to those skilled in the art, and it is therefore preferred that the instant invention be limited not by the specific disclosure herein, but only by the appending claims.

CLAIMS

1. A nozzle assembly for a vacuum cleaner, said assembly including an inlet, outlet means at which low pressure is applied to said assembly to draw dirt particles through said inlet into and through said nozzle assembly across a floor, floor engaging rotatably mounted brush means operatively connected to said first wheel means to be driven by rotation of the latter and when so driven driving dirt particles toward said inlet.
2. A nozzle assembly as set forth in claim 1 in which there is a second wheel means secured to said brush means and frictionally driven by said first wheel means.
3. A nozzle assembly as set forth in claim 2 in which the first wheel means rotates at a speed substantially slower than the speed of rotation for the second wheel means.
4. A nozzle assembly as set forth in claim 2 in which the first and second wheel means rotate in opposite directions on parallel axes.
5. A nozzle assembly as set forth in claim 2 also including a floor plate defining said inlet, said outlet means including a hollow swivel fitting pivotally connected to the floor plate and releasably connectable to a hollow handle through which low pressure is applied to said assembly.
6. A nozzle assembly as set forth in claim 5 in which the second wheel means is mounted for rotation on a first axis that is fixed with respect to said floor plate and the first wheel means includes first and second wheels rotatably mounted on individual axes disposed at opposite sides of said floor plate and bodily movable with respect to said floor plate.
7. A nozzle assembly as set forth in claim 5 also including a cover secured to the floor plate and having first bearing means that cooperates with second bearing means on said first floor plate to pivotally support and retain the swivel fitting.
8. A nozzle assembly as set forth in claim 7 in which the swivel fitting includes a hollow neck having one end releasably connectable to a hollow handle, said cover including a slot within which said neck moves as said swivel fitting pivots about a swivel axis defined by said first and second bearing means, said neck extending transverse to said swivel axis.
9. A nozzle assembly as set forth in claim 8 in which the swivel fitting includes first and second bearing sections spaced along said swivel axis and disposed out-board of the neck on opposite sides thereof, each of said first and second bearing means including laterally spaced first and second portions operatively engaged with the respective first and second bearing sections.